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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/693,925	10/28/2003	Duck-Chul Hwang	1567.1057	4145

49455 7590 02/28/2007  
STEIN, MCEWEN & BUI, LLP  
1400 EYE STREET, NW  
SUITE 300  
WASHINGTON, DC 20005

EXAMINER
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LEWIS, BEN

ART UNIT	PAPER NUMBER
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1745

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/28/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

## Office Action Summary

Application No.

10/693,925

Applicant(s)

HWANG, DUCK-CHUL

Examiner

Ben Lewis

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-36 is/are pending in the application.
- 4a) Of the above claim(s) 6 and 30-36 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5 and 7-29 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. ____                                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>10/28/03, 12/17/04</u> .                                      | 6) <input type="checkbox"/> Other: ____                           |

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Applicant's election with traverse of Group I, species (elemental sulfur S<sub>8</sub>) claims 1-5 and 7-29, in Paper filed December 14<sup>th</sup> 2006 is acknowledged. The traversal is on the ground(s) that Group I and II are not independent. This is not found persuasive because regardless of search method, invention of different limitations will require different search strategies, and the times to consider the relevancy of collective references would increase proportionally as well.

The requirement is still deemed proper and is therefore made FINAL. Therefore, claims 6 and 30-36 are withdrawn from consideration.

### ***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claim 16 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

4. Claim 16 recites the limitation "the central portion." There is insufficient antecedent basis for this limitation in the claim.

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5. Claims 17-29 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The claims are drawn to a product and have methods of operating or using the product, cycle life testing steps mixed in with the product claim. It is held that a single claim, which claims both an apparatus and the method steps of using the apparatus, is indefinite (MPEP 2173.05).

Furthermore, mixing statutory classes together would result in the public not knowing the meets and bounds of the claim and whether or not the claims are being infringed upon.

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1-5 and 7-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Grokovenko et al. (US Patent No. 6,210,831) and further in view of Naruoka et al. (U.S. Pub No. 2002/0086210 A1).

With respect to claims 1, 2, 10 and 11, Grokovenko et al. discloses a cathode with electroactive sulfur material in a battery (title). Grokovenko et al. also teach that to obtain high energy densities, the lithium can be present as the pure metal, in an alloy or in an intercalated form, and the sulfur can be present as elemental sulfur (Col 1 lines 45-55). Grokovenko et al. also teach that examples of suitable anode active materials for use in the anodes of the cells of the present invention include, but are not limited to, lithium metal, lithium-aluminum alloys, lithium-tin alloys, lithium-intercalated carbons, and lithium-intercalated graphites (Col 6 lines 20-25). The solid composite cathodes comprise an electrolyte (Col 6 lines 5-10).

Grokovenko et al do not specifically disclose the average particle diameter of the positive active material being approximately 10 $\mu$ m or less. However Narouka et al. disclose a positive active material for non aqueous electrolyte secondary battery (title) wherein, The positive active material preferably has a mean particle diameter  $D_{50}$  of from 4 $\mu$ m to 25 $\mu$ m and a BET specific surface area of from 0.2 to 1.5 m<sup>2</sup>/g (Paragraph 0026). Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the same particle size of Narouka et al. for the particle size of the positive electrode active material of Grokovenko et al. because Narouka et al. teach that by using a lithium-nickel composite oxide having a mean particle diameter  $D_{50}$  of from 4 $\mu$ m to 25 $\mu$ m as a positive active material, the capacity density can be kept high (Paragraph 0023).

With respect to claims 3-5, 7-9 and 12-15, Grokovenko et al as modified by

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Narouka et al. do not disclose any positive electrode roughness data. However, it is the position of the examiner that such properties are inherent, given that Grokovenko et al as modified by Narouka et al. and the present application use the same positive electrode active materials with the same particle sizes. A reference which is silent about a claimed invention's features is inherently anticipatory if the missing feature is necessarily present in that which is described in the reference. In re Robertson, 49 USPQ2d 1949 (1999).

With respect to claims 25-26, Grokovenko et al as modified by Narouka et al. do not disclose open circuit voltage data. However, it is the position of the examiner that such properties are inherent, given that Grokovenko et al as modified by Narouka et al. and the present application produce an electrochemical cell using the same positive electrode active materials with the same particle sizes. A reference which is silent about a claimed invention's features is inherently anticipatory if the missing feature is necessarily present in that which is described in the reference. In re Robertson, 49 USPQ2d 1949 (1999).

With respect to claims 27-29, Grokovenko et al as modified by Narouka et al. do not disclose any cycle life testing data with respect to the amount of positive active material present in the positive electrode after cycle life testing is done. However, it is the position of the examiner that such properties are inherent, given that Grokovenko et al as modified by Narouka et al. and the present application produce an electrochemical

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cell using the same positive electrode active materials with the same particle sizes. A reference which is silent about a claimed invention's features is inherently anticipatory if the missing feature is necessarily present in that which is described in the reference. In re Robertson, 49 USPQ2d 1949 (1999).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ben Lewis whose telephone number is 571-272-6481. The examiner can normally be reached on 8:30am - 5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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Ben Lewis

Patent Examiner  
Art Unit 1745

  
JOSEPH RYAN  
PATENT EXAMINER